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ABSTRACT

The Ohio College Library Center (OCLC) is a nonprofit computerized library processing center operating out of Columbus, Ohio. Six years after its incorporation, OCLC is now mainly in the business of operating a shared cataloging system and producing catalog cards designed to meet the needs of each of its member libraries. OCLC also maintains a union catalog of its member libraries as a byproduct of this service. Its data base grows at the rate of about 1,000 records per day, both Library of Congress (LC) MARC records and the original cataloging done by member libraries. Catalogers in OCLC's member libraries, using their computer display terminals, can call up records in catalog card format by imputing LC number, author, or title. Records can be modified online to meet local needs. This report further describes OCLC in terms of the basic cataloging process, the system's advantages and disadvantages, and the costs to and responsibilities of participating libraries. Appendixes outline planned OCLC subsystems and LC's MARC and RECON projects. Sample OCLC printouts are included. (Author/SL)

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MICHIGAN LIBRARY CONSORTIUM
Report #2

THE OHIO COLLEGE LIBRARY CENTER: AN OVERVIEW

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BY
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January, 1974

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INTRODUCTION

This report, written over the past six weeks at the request of the Michigan Cooperative Executive Committee, grew out of the Conference on Michigan Academic Library Cooperation held in Lansing on November 14-15, 1973. At that meeting it was apparent that more information was needed if Michigan libraries were to become involved with the Ohio College Library Center. Consequently I have tried to present a broad background picture of what OCLC is doing--its history, problems, accomplishments, and future prospects--and how we might be affected if Michigan libraries decide to tie in with the Center. Though I have attempted to keep it as factual as possible, I am certain prejudices have slipped in. Having worked with this system for approximately fifteen months at Drexel University in Philadelphia, I can not but be enthusiastic over the Center's achievements. Wherever possible I have tried to put extraneous information in footnotes or an appendix. For those of you who have been following the literature, some of this may be routine. For others, I hope it answers some questions and raises still more. A short bibliography of suggested reading is found at the end.

BACKGROUND INFORMATION

The Ohio College Library Center (OCLC) is a not-for-profit, computerized library processing center operating out of Columbus, Ohio. Its purposes, as stated in the OCLC Amended Articles of Incorporation, are "...to establish, maintain and operate a computerized, regional library center to serve the libraries of Ohio (both state and private) and designed so as to become a part of any national electronics network for bibliographical communication; to develop, maintain and operate a shared cataloging program based upon a central store; to create, maintain, and operate a computerized central catalog (inven-

tory) of books and journals in the participating libraries; and to do such research and development as are necessary to accomplish and extend the concept."[1] Today, six years after its incorporation, the Center is mainly in the business of operating a 'shared cataloging' system and producing catalog cards designed to meet the needs of each of its member libraries. As a by-product of this service, it serves as a union catalog by providing a location symbol for each new title cataloged within the system, giving information concerning holdings of neighboring libraries to be used in book selection and avoidance of unnecessary duplication, and making available bibliographic information that can be used in ordering. To date, it is unquestionably the most successful cooperative of its type, furnishing library personnel with cataloging data when and where they need it.

OCLC's Director, Mr. Frederick G. Kilgour, has long been involved in library automation activities. As Associate Librarian for Research and Development at Yale University, he was instrumental in starting the Columbia-Harvard-Yale Medical Libraries Computerization Project back in 1961.[2] Kilgour argues that computers can do two things for libraries: 1) save money and stabilize costs and 2) increase services through personal attention.[3]

To demonstrate the financial savings that can be made, the Center's off-line card production system, which lasted about thirteen months, produced over 440,000 catalog cards ready for filing with overtyped headings at an average cost of 10.6 cents per finished card. At the time this compared favorably with the cheapest manual procedures of 23.6 cents per card.[4] It should be kept in mind that these figures and all other cost figures cited are artificial in that they do not take into account the various state and federal monies that have gone into the development of the OCLC system. A more current figure for the on-line operation shows that during the FY 1972/73, OCLC libraries cataloged 572,000 titles, producing nearly four million catalog cards, at a cost of

$2.02 per title for Ohio libraries and a slightly higher cost for libraries outside of Ohio.[5]

According to Kilgour, a second advantage of a computerized system--customized services and greater humanization--results from the digital computer's ability to treat individuals as individual people and events as individual events.[6] From a technical services' viewpoint, the personal touch is apparent in OCLC's present card production system. A library joining the cooperative must submit an explicit profile showing how that library wants its catalog cards to appear. Current options for card production make it possible to produce cards for a single title in about seven thousand usable combinations of elements. These cards are individually formatted for type and placement of call number, include provision for four different indentions, upper-case or upper and lower-case letters for subject headings, and a host of other tailored options to fit the needs of a specific library. This flexibility, characteristic of computer-based systems, is an important difference between such systems and traditional manual procedures where each additional option requires a greater expenditure of processing time and therefore increases costs.[7] The Center provides these cards in final form, prefiled and alphabetized in packs for immediate filing in a library's card catalogs.

OCLC is based on what might be termed a 'data utility' concept. Even in the late Sixties it was clear that only a few of this country's most well-endowed universities could afford to develop an integrated library automation program. However a cooperative like OCLC could afford the heavy initial investment in computer and telecommunications hardware, plus the talent and programming skills needed to implement such a system. From the start Kilgour has shown exceptional administrative ability in keeping OCLC funded, continuing research on projected subsystems, and making the Center relate to the needs of large and small academic and public libraries, each of which considers

itself unique. While not everyone agrees that OCLC is in fact significantly reducing the unit cost per title cataloged, there can be no doubt that within the next decade more and more regional OCLC-type systems will be linking together to form a national library network.

HISTORY AND ORGANIZATION

The Center's history goes back to 1962 when the Ohio College Association (OCA) appointed Wyman Parker to perform a feasibility study on creating more inter-academic cooperation among Ohio's college and university libraries. Parker's report called for the establishment of a center for inter-library loans and the cooperative purchase and storage of microform materials. Various corporations were asked to present proposals for such programs and OCA's Committee of Librarians gave serious consideration to two of them. One called for the construction of a union catalog employing micro-techniques, while a second proposed a central computer storage base to handle union catalog holdings. When the Committee could not make up its mind, two consultants were called in to investigate the possibility of an automated system.

Dr. Ralph Parker and Mr. Fred Kilgour were invited to study the alternatives available. Both men rejected earlier proposals and suggested the formation of a regional library network based on the retrieval of MARC records. OCA agreed to support such a project and OCLC was incorporated as a non-profit organization in July of 1967. Kilgour was appointed Director and a short time later he outlined a comprehensive program calling for five evolving subsystems: 1) shared cataloging, 2) serials control, 3) a technical processing system (acquisitions and funds control), 4) circulation control, and 5) a bibliographic information retrieval system.[8] The Center's first few years were devoted to laying the groundwork for the organization, bringing together a staff, performing research, and experimenting with systems design. In April 1970 off-line

catalog card production went into operation.[9]

OCLC members in Ohio pay an annual assessment based on the number of monographic titles each library cataloged during the previous year. A member has the privilege of appointing a representative to the Center and these individuals elect from their group nine trustees--three each year for staggered three year terms--whose responsibility and authority parallel those of most corporate institutions.[10] Participating libraries outside of Ohio, belonging to other networks, are not considered 'members.'[11]

OTHER CONSORTIA AFFILIATED WITH OCLC

OCLC now has approximately 55 academic library members in Ohio and about eight public library system members. Out-of-state it has signed agreements with at least five other consortia: the Cooperative College Library Center (CCLC) in Atlanta, which performs centralized processing for a group of about twenty-two small, Black colleges located throughout the South; the Five Associated University Libraries (FAUL), whose members include the State University of New York's campuses at Binghamton and Buffalo, Cornell University, Syracuse University, and the University of Rochester; the New England Library Information Network (NELINET), an educational consortia under the New England Board of Higher Education situated in Wellesley, Massachusetts and made up of a large group of academic libraries in the Northeast; the Pennsylvania Area Library Network (PALINET), a developing cooperative of seven college and university research libraries in Eastern Pennsylvania and Delaware formed under the aegis of the Union Library Catalogue of Pennsylvania; and the Pittsburgh Regional Library Center (PRLC), a small consortia of academic institutions with headquarters at Chatham College in Pittsburgh.

In addition, OCLC has signed a contract with the Library of Congress acting on behalf of the Federal Library Committee that provides for experimentation in

on-line cataloging with several federal libraries.[12] The Center is preparing to sign agreements with the Interuniversity Council of the North Texas Area and with the State University of New York at Albany. The Association of Southeastern Research Libraries (ASERL), representing about one hundred academic libraries in the South, is also in the organizational stage of tying in with OCLC. This project is referred to as SOLINET (Southeastern Library Network). The cooperating college and university libraries in New England, New York, Pennsylvania, Delaware, and the South have formed a group called the 'Council of Regions' whose purpose is to deal with OCLC on matters of mutual concern.[13] Operational services currently provided by OCLC are discussed in the following sections; for an outline of those services that the Center plans to implement in the coming years see Appendix I.

SHARED CATALOGING SYSTEM

Thus far the only fully operational subsystem is the Shared Cataloging System. It operates Monday through Friday from 7:00am to 7:00pm, except the four holidays of Independence Day, Labor Day, Thanksgiving, and Christmas. Its three major functions are: 1) production of catalog cards, 2) making available cataloging done by one library to all other users of the system, and 3) provision for union catalog location directory.[14] Designed to reduce the unit cost of cataloging by taking advantage of the MARC data base and high-speed labor-saving machines, this syetem now processes about 4500 titles per day, generating approximately 30,000 catalog cards per day.[15] Shared cataloging allows quick access to cataloging data, diminishes processing time, and reduces the amount of local and original cataloging that need be done.

Off-Line Operation

Off-line operation began in the spring of 1970. In this early phase libraries were able to request catalog cards by means of the Library of Congress

card number alone. It worked in the following manner. Libraries were distributed sets of color-coded data processing cards on which they wrote in the LC card number as found on the verso of a book's title page. These cards were then sent in batches to Columbus, where they were run against the file of MARC tapes. A library could either accept the MARC cataloging sight-unseen or request a unit card to be returned to the initiating library. In the latter case, the unit card was edited and any changes were noted on a different colored data processing card (e.g., creation of a local call number) and returned to the Center for final printing of cards. For those items not initially found in the data base, a library could set a time span--one to thirty-six weeks--for periodic checking against the master file as the new weekly tapes were added. The completed card sets were then returned through the mail or by parcel post in alphabetized packs to the library.[16] Sometimes it is necessary that new participants still utilize off-line production; its advantages and disadvantages will be discussed in a later part of this paper.

On-line operation

Kilgour stated that prior implementation of the off-line system proved a tremendous asset when the Center went on-line in late August 1971. Many of the programs had already been debugged when the time came to install terminals for on-line access. In the meantime, a Xerox Systems SIGMA 5, a third generation computer, had replaced the four Ohio State University computers used in the off-line operation.[17] From the users' perspective, on-line equipment consists of three items: 1) a data set or MODEM (Modulator-Demodulator)--a telephone systems interface that converts the binary code signals of the CRT terminal and Ohio computer into tone signals that can be transmitted over standard voice-grade telephone lines, 2) a cathode ray tube (CRT) terminal that serves as a visual display screen for the bibliographic records, and 3) a semi-portable keyboard modeled after a standard typewriter keyboard with all the supplemental

characters needed to print the ALA print train.

On-line access can be had in three ways: LC card catalog number, a truncated title search key, and a truncated author-title search key. The advantage of calling up a bibliographic record and viewing it on the CRT as it will be printed on catalog cards is obvious. Libraries are free to add new data elements or fields, alter existing ones, or delete them entirely, based solely on that particular library's needs. Such local changes do not in any way affect the master record in the file, however a record of how a library cataloged its titles is maintained on a separate 'history' or 'archival' tape. If the library is unable to find cataloging for a title in the data base, it is obliged to catalog that item originally and input it into the Center's file. This new record is then accessible to all other libraries that wish to catalog the same book. When the LC MARC record becomes available, it automatically replaces the original input record cataloged by the local library and whatever holdings information that was attached to the old record is transferred to the MARC record. Once the cataloger has called up a record and edited it on the terminal, he can request a set or sets of catalog cards by hitting a 'PRODUCE' button on the keyboard. At this command, a three letter code--unique to the holding library that requested cards--becomes displayed with the record. In this way another library searching the same title can see at a glance who owns it.*

UNION CATALOG INFORMATION

As Mr. Philip Long, former Associate Director of OCLC, pointed out at the

* Hardware at Columbus includes the SIGMA 5 with a 256K main memory and an operating system extensively modified to manipulate large files of data. Ten Xerox dual density discs maintain access indexes, plus the file of catalog records. Access is by scatter storage techniques into the indexes, which use pointers to refer to the actual catalog records, arranged in a sequential, accession order. Cards are produced on an IBM 1403-N1 line printer, coupled to the main computer by a Spur 1403 Controller. Printing requires about seven hours a day, with the printer producing four thousand cards per hour. For a technical discussion of OCLC computing hardware, programs, and OS, see Kilgour's article in the September 1972 issue of the Journal of Library Automation.[18]

Michigan Conference on 14 November, use of the data base as a location tool is heavy. There are over one and one half million holdings appended to the 750,000 bibliographic records in the data base; however this does not give a true picture of how many libraries have used the same titles. To begin with, only 52% of the 750,000 records are LC MARC records, the remaining 48% represent original input cataloging from participating libraries. Of the approximate 390,000 LC MARC records, an astonishing 60% have never been used at all, while the other 40% have been used an average of five times. Of the approximate 360,000 local input records, there is a use frequency of 1.5 per record. Kilgour estimates that only one search in five results in a set of catalog cards being requested. This means that about 80% of all searches is for union catalog listings, acquisitions searching, and random playing around with records for demonstration purposes and 'fun and games.'[19]

Obviously the usefulness of the OCLC data base as a location device for ILL derives from the number of titles a library has cataloged from the data base and the number of cooperative libraries one can draw on for loans. If a good many Michigan libraries were to go on-line tomorrow, it would still takes months or years before this system would begin to yield multiple locations for titles cataloged in this state. Moreover, locations could only be determined for the most recent accessions of the participating libraries; all retrospective holdings would not be available unless a library were to input its entire shelf list to the data base.* Mr. Long also made the point that, contrary to expectations, the large research institutions were not overwhelmed with requests for interlibrary loans. Rather libraries with small collections are able to locate items in nearby places and avoid the large research libraries all together. About half of the OCLC members in Ohio have extended their borrowing

* Interestingly enough, Wright State University in Dayton did convert its shelf list via terminal to the file; this project included about 150,000 titles of which about 20% were found to be already in the data base. Cleveland State University and Walsh College in Canton are conducting similar projects and finding a much higher percentage--about 50%--of titles already entered.[20]

privleges tc undergraduate students of other OCLC schools.[21]

ACCESSIONS LISTS

The Center now makes available programs for printing accession lists of books acquired over a given perici of time. This service is one example of what can be done with a library's 'history' tape. One program produces a printout with entries arranged in call number order, essentially a classed listing. Another program arranges new titles under alphabetized subject headings (only the first subject heading in the record is employed). These printouts can be obtained on either Offset Masters or on plain white paper for photo-offset printing or Xeroxing.[22]

THE OCLC DATA BASE

The Center's data base consists of two types of records: Library of Congress MARC records* including LC's RECON '68 and '69, Popular Titles, and Cataloging-in-Publication (CIP) records; and bibliographic records input from participating libraries. These latter can either be truly original cataloging or records taken from some other source--such as shared catalog entries from the NUC volumes or LC cataloging from a proof slip or depository file--and keyed into the data base. As of November, 1973 there were a total of about 750,000 total records, almost evenly divided between LC and original input records. This cataloging stockpile grows at a rate of one thousand new records a day; on an average, libraries input 3000 new records weekly and 2000 MARC records come weekly from the Library of Congress.[23]

One can make the generalization that the data base is limited in scope to English language, monographic titles cataloged from 1968 to the present. This is not to say that one will not find thousands of records for imprints cataloged

* Appendix II provides a description of the MARC and RECON projects.

prior to 1968. Nor does it preclude foreign language volumes or open entries. Reasons for the diversity of catalog records include the following: 1) many libraries are performing original cataloging for books with pre-1968 imprints and inputting them into the data base or they may be merely transferring copy from the NUC volumes and these titles include foreign language material* published over a wide time span and some types of continuations; 2) some libraries have input their shelf lists into the data base; and 3) since mid-1973 LC has been issuing MARC tapes for French monographs. One will find records for some government documents that libraries have decided to catalog as monographs, but none for maps, records, films, or other AV material. Music scores however can now be input and it seems just a matter of time before MARC formats for all types of material are adopted.[24] To improve shared cataloging for medical libraries, the Center's Advisory Committee of Cataloging has agreed to allow the addition of NLM class numbers and MESH subject headings to appropriate records.[25]

The percentage of titles a library finds in the data base depends to some extent on its acquisitions. The largest library in the system, Ohio State University, found bibliographic records for about 65% of its acquisitions during the 1973 calendar year. From my own experience at Drexel University, cataloging information was found for approximately 80 to 85% of all new titles. The library went on-line in February 1972 and was one of the first PALINET members. Drexel has a relatively small collection, about 340,000 volumes, adding eight to ten thousand monographs per year. Acquisitions are heavy in science and technology, with few foreign titles.

As might be expected, this huge data base is not without its problems. With each library having the privilege to input its own cataloging--and there being no overall authority file--errors get into the data base in both cataloging quality and in applying the appropriate MARC tags, indicators, subfield

* OCLC estimates that about 25% of the locally-input records are for non-English language titles.[26]

codes, etc. to this cataloging. This lack of bibliographic control has been one of the major criticisms directed against the OCLC operation; others might argue it is a small price to pay for local variation. When a library discovers a mistake within a record--whether it is LC's, its own, or another library's cataloging--it is obliged to send in an Error Report Form to Columbus. Sometimes of course such 'errors' are merely a matter of professional judgement; one cataloger might enter a book under a symposium main entry whereas another would choose the title for the main entry. 'Errors' also result from copy variation.

OCLC keeps tabs on all such errors and has some statistics on their frequency. In the six month period between 4 September 1972 and 4 April 1973, libraries input 87,487 catalog records. As of 10 April 1973, there were 4,705 reports of errors in these same records. Further analysis showed that 4,150 (88.2%) came from the cataloging source library and 555 (11.8%) from a library other than the cataloging library. OCLC has dubbed these latter errors 'effective errors' because they inconvenience a library other than the cataloging source library. The effective error rate from the study represents .6% of all input records.[27] The majority of error reports received, about 50%, involve misspellings by the operator, especially in foreign languages. Though this error rate will continue to rise as more and more libraries must utilize these records, OCLC feels that an 'effective' error rate of less than 1% is tolerable. In day-to-day cataloging most of these mistakes are caught in the editing or proofreading stage, prior to actual production of catalog cards.

OCLC is a rather 'forgiving' system compared to other machine systems. One can always count on some sort of response from the computer, regardless of the query. Programs automatically check for certain types of errors when new data enters the system. Illegal tags, indicators, subfield codes, holding library symbols, and certain characters will block a field from being sent; however an operator can still make spelling and punctuation typos or assign tags that are

legal but incorrect to the field in question.

WORKING WITH THE CRT AND MARC FORMAT

Acclimating one's self to work with the on-line equipment and MARC record is not nearly so imposing as it sounds when people start talking about fixed and variable fields, data elements, delimiters, and other such jargon. It is just learning some new terms for old concepts. At first most people have problems in looking at the cataloging on the display screen simply because it does not appear in the customary form: that is, the main entry is not in boldface type, there are no convenient spaces between lines or indentions as appear on printed cards, and the subject headings are not neatly tucked away at the bottom of the card. Instead the various fields of information are in numerical order and are tagged with numbers. In spite of this, it only takes a week or so in front of the CRT before one begins to adjust to this novel array of information. After awhile, LC printed cards look awkward!!!

Another early obstacle that one must become reconciled to is learning the use of MARC tags and other code symbols that make explicit to the computer where one piece of information ends and another begins. Fortunately there are patperns that can be transferred from one group to another; this saves the inexperienced operator from checking the manual for every tag and indicator. Again, it is just a matter of looking at a sufficient number of such records before tagging loses its mystery. Perhaps the worst approach is to sit down with a MARC format book and try to memorize them all at once.

The length of time it takes to catalog a title depends on a number of factors: whether one is working from existing cataloging information--either an LC record or one input by another library; whether one is inputting original cataloging; and the extent of authority work that must be done before hitting the 'PRODUCE' button. If the cataloging source is the Library of Congress,

and in the past the library has generally accepted LC practice, all one must do is check the descriptive cataloging against the book in hand, inscribe the call number in the book, key in any accessions information that is needed (e.g., copy number, date, and initials of the cataloger), and type in a symbol for a holding library, if one is required.

Though a library is not charged by the number of searches it performs or the length of time spent interacting with the computer in Columbus, it is counterproductive to attempt elaborate authority work while one is working on the terminal. Different libraries cope with the problems of verification, authority cards, and possible cross references in different ways. Some note the main entry, secondary added entries, and subjects in a pre-search (this can be performed by either acquisitions at the time the book is ordered or as a separate catalog department search) and are able to verify and create authority cards and needed references before the book is actually brought to the terminal for card production.[28] Others prefer to accept the record as is, leaving verification and authority work to when the cards arrive in the library. The fact that the operator cannot bring the CRT to the public catalog or distant authority files does pose some serious problems, especially since there is no immediate hard-copy printout available. For libraries outside of Ohio, there might be a seven to fourteen day turn-around time. However one does it, efficient use of a CRT requires a major change in department work-flow procedures.

As a rule the average cataloger should be able to produce cards with LC source copy for eight to twelve titles per hour, while a more experienced person might do as many as twenty titles per hour. Of course when the cataloging source is not LC or the record must be input, it takes longer. For local input cataloging the operator can request a 'work form' on the terminal screen that contains a skeleton outline of the MARC II format. A typist can then key in the various tags and bibliographic data that has been prepared by the catalog

librarian. Depending on the length of the record, a typist should be able to input an average length record within fifteen minutes. Some libraries may find it more efficient to have two people working at the terminal at the same time; this way one person can do the legwork in checking authority files or shelf list and the other can manipulate the cataloging to suit local needs.*

ON LINE EQUIPMENT AND SEARCHING

As stated earlier, there are three pieces of equipment necessary to operate in an on-line capacity: the data set or MODEM, the cathode ray tube (CRT), and the keyboard.** The CRT terminal, which looks like a small TV set, is actually a satellite computer with its own memory and logic circuits for manipulating alphanumeric characters. The system has a maximum work area of 4096 characters, adequate to handle all MARC II records which do not exceed 2048 characters. The terminal screen itself can only display 1024 characters at one time, however a 'line roll' function allows the terminal memory to increase character capacity by four times.[29] When it is turned on, a small vertical dash (known as the 'cursor') begins to blink. This blinking character can be moved anywhere on the display screen by depressing directional arrows on the keyboard. The cursor tells the operator where the next character is going to appear. Changes in a record are made by over-typing the characters within an existing field or by deleting the entire field and creating a new one. One get 'on-line' by turning on the power to the CRT terminal and then typing in his or her social security number--these numbers having been verified in Columbus beforehand. Within a few seconds a message comes back greeting the operator with the appropriate

* An interesting but somewhat negative appraisal of the problems that arise in cataloging with an OCLC terminal is found in the Summer, 1973 issue of Library Resources & Technical Services. Entitled "The Other Half of Cataloging," this article examines traditional catalog department activities that OCLC cannot facilitate--namely, the merging of a new record into the existing catalog.

** See Appendix III for pictures of CRT and keyboard.

salutation of the day, informing him what mode (full or partial) he will be working in, and the volume and number of the latest MARC tape entered into the data base.

The difference between 'full' and 'partial' mode is that social security numbers authorized by the participating library in the full mode can request or produce a set of catalog cards; work done by operators in the partial mode is stored in a 'SAVE' file so that there can be a final revision by a paraprofessional or librarian before cards are produced.[30] Because of limited storage space and some past abuses of the 'SAVE' file, OCLC recommends that no more than twenty records be stored in this manner.

The terminal operator has four possible ways to call up a record to the terminal screen: LC card catalog number, a six-character key derived from the record's author and title, a six-character key derived from the record's title alone, and the OCLC control number. The last access point is an in-house control number assigned serially by the Center to every new record entered in the file; it has no search value unless one has examined the record once before and noted the number. All records are represented in at least three of the four indexes--the exception being not every record has an LC card catalog number. The most efficient method to search a title is by LC card number, if the book has one, since it will usually retrieve but one item. Title and author-title search keys are used for books that do not have an LC card number or have an incorrect one.

The author-title search key is composed of the first three characters of the first word in the main entry, followed by a comma, and the first three characters of the first word in the title, disregarding initial English articles. For example, if one were searching for the cataloging of Joseph Fitting's The Development of North American Archaeology, he would type on the screen the following key: fit,dev. It does not matter if upper or lower case characters

are used.

For title searches one uses the first three characters of the first word in the title, followed by the initial character of the next three words--all separated by a comma. Going back to the above example, the title search key would be: dev,o,n,a. Title and author-title searches may produce a number of entries that meet the requirements of the search key. In these cases all of the possible candidates that meet the code are displayed and numbered in an abbreviated fashion. The operator then types in the matching number for the record he is after. OCLC has an extended search function that makes possible retrieval of up to 256 entries all having the same search key. Title searches, depending on the uniqueness of the title, produce fewer multiple entries than do author-title searches. When the search key is input, the computer distinguishes which index to search in by means of the punctuation used within the key: that is, one hyphen, one comma, or three commas.[31] If an author or title does not contain sufficient characters to fill out the search key, blank spaces are left between the commas.

ADVANTAGES OF PARTICIPATING WITH OCLC

Some of the advantages of utilizing the OCLC system have been implicit throughout this paper. No other system in operation has reached the level of sophistication that OCLC has and, if the lack of initiative and direction from our national libraries persist, the Center could turn out to be the headquarters of a national library network. There are obvious advantages to being in on the groundfloor of such a system. Stated more succinctly, OCLC offers the following:

a) The long-range potential to increase productivity and stabilize costs.

b) The system serves as a union catalog and facilitates ILL.

c) It makes possible book selection and cooperative collection development

for a library consortia and can be used in acquisitions searching.

d) On a technical level it has the capability to search a large file almost instantaneously in random order through three different access points. Manual procedures for a file of LC proofs or depository cards can only be arranged one way, either by main entry or by title.

e) In contrast to the reduction of autonomy associated with most other network concepts, there is present in the OCLC system a tremendous degree of flexibility in revising and editing data to suit local needs.

f) A library has approximately twice the number of bibliographic records to work with than the LC MARC tapes contain; this is especially significant when one considers that many libraries are processing basically the same titles.

g) Original cataloging can still be accomplished and input into the file, thereby eliminating the need to type original unit cards or call numbers on LC proofs, having them duplicated, added entries overtyped, proofread, sorted into receiving catalogs, and alphabetized for filing in the various catalogs. These are the same routines that are both tedious to those who must do them and take large amounts of money from the library's budget.

h) OCLC catalog cards are formatted according to each library's specifications and printed off-line with the ALA print train on acid-free Permafile card stock. This results in an attractive, legible, well-proportioned text in upper and lower case characters requiring about 7% fewer extension cards than do LC printed cards.*

i) The computer system has demonstrated itself to be extremely reliable, with 'down time' accounting for less than one percent of total operating time.

j) Equipment is easily mastered, demanding no special skills or knowledge of data processing to interrogate the files or produce catalog cards.

The need for some sort of machine-readable, centralized processing-center

* Examples of OCLC catalog cards can be found in Appendix IV.

is becoming more apparent as library budgets continue to decline and staff costs keep pace with an inflationary economy. From the administrator's point of view, symptoms of a system breakdown include a growing backlog of uncataloged books, a higher and higher unit cost per item cataloged, and increased delays in the time it takes to process materials. Perhaps the major problem is that current library procedures are by-and-large manual procedures. Books today are being cataloged much as they were seventy years ago when the Library of Congress first started distributing catalog copy. Making use of today's technology is one avenue to increasing library workers' productivity.[32] Whereas computer and telecommunications costs have sharply decreased over the past ten years, personnel costs have continued to spiral. For those who must balance budgets and demonstrate measured services for requested funds, this dilemma is painfully clear. Quite simply, if we persist in outdated library attitudes and procedures, each technical services dollar will have less real value and library users will go elsewhere for their information needs. Whether or not OCLC comes to Michigan is one question; there is no question that our libraries must become more dependent upon one another and machines.

DISADVANTAGES OF OCLC

Obviously no library system--automated or otherwise--is without its problems. Criticisms of OCLC range from the inability of the terminals to provide hard copy to fundamental design and implementation planning. No doubt the first question that comes to an administrator's mind is "How much is this thing going to cost me?" Surprisingly enough, there have been no meaningful 'before and after' cost studies published in the literature by participating libraries. Though costs for technical services have traditionally been hard to arrive at, the lack of comparative data makes one suspicious, particularly when one considers the thousands of dollars in grant money and state aid that the Center

has received over the years. What would happen if OCLC had to become totally self-supporting? Would the Center collapse or would funding be passed on to members at an exorbitant per title cost?

Another frequent objection is that cost estimates given by OCLC are open-ended and vague. Partially this results from the fact that until a specific number of libraries have committed themselves to join, accurate processing and communications costs cannot be figured. It can become a vicious circle when a newly formed cooperative (such as ours) is unable to commit itself until precise per title charges are agreed on and OCLC cannot provide this information until the number of anticipated titles to be cataloged and the number of lines and distances between the libraries are computed. It should be kept in mind that at least initially a library must operate parallel processing systems in terms of equipment and personnel; that is, one must continue to pay the bills for the old card production system for things that cannot be put on the terminal (like Hebrew, Chinese and Cyrillic characters, as well as serials, AV material, and the like) and at the same time meet OCLC's costs. Projected savings that might result from gradual attrition or reassignment of personnel may take some time.

Despite a good deal of talk and a few published reports (most notably, those of the IUC group in Texas, ASERL in the Southeast, and NELINET in the Northeast),[33abc] no other consortium has reached the point of duplicating the OCLC system. If this is to become the prototype node in a national library network, it seems essential that the potential for duplication be assured and tested. Some say this will be doubly difficult for OCLC because the software is poorly documented. One does not duplicate such a complex system by merely buying the same hardware, copying programs and data base, and plugging it all in with fingers crossed! Others are skeptical about the choice of equipment Kilgour made, arguing that a Xerox system, as opposed to IBM, does not have the interface

quality for a national network. The company that manufactured the first CRT's that the Center used--The Irascope terminal from Spiras, Inc.--has already gone out of business. Indeed, it would be diastrous to develop a network of regional library centers and then realize later that they could not communicate with one another.

At the November 14 Michigan Conference, Lawrence Livingston mentioned some of his principal objections to OCLC. He pointed out that the data base is incomplete--that is, there is a relatively small percentage of pre-1968 records and foreign titles and this situation is likely to remain for some time; the files are inconsistent in that both LC and OCLC libraries have not always included the same data elements within records; and there is no single authority file or cross references built into the data base.[34] One final note of concern for large research libraries is the Center's inability to process non-Roman alphabets. Given time and money, all of these objections can be met with.

RESPONSIBILITIES AND STANDARDS REQUIRED BY OCLC

New participants' contracts generally require that they input all their Roman alphabet cataloging that cannot be found in the data base.[35] Of course there is no way OCLC can determine if a library is complying with this obligation. A library performing input cataloging must maintain certain basic cataloging standards; these standards are spelled out in great depth in one of the latest OCLC publications, On-Line Cataloging (1973).[36] For input cataloging to be useful to other libraries it requires a minimum of checking and changing. As a rule, LC practice should be followed in so far as that practice can be determined by a local library following its own policies of verification. When LC practice cannot be determined, the Anglo-American Cataloging Rules should be applied.[37]

When the Library of Congress implements the International Standard Bibliographic Description (ISBD) format on its MARC records, OCLC will use the new format as received and require all input to be in the same form. Nevertheless it will still be possible to suppress ISBD elements for printing on catalog cards as each library desires. ISBD is a standard for the international exchange of data, not a requirement for local cataloging.[38]

WHAT ARE THE ALTERNATIVES?

Over the past twenty years libraries interested in automating had very few choices. They could play it safe and do nothing, they could try to do it on their own, or they could form together in a cooperative venture to share costs of equipment and development. Hindsight tells us that this last approach can result in a highly successful system at only moderate cost to members. This is not to slight the achievements of other computerized projects, most of which were intended to serve a single library. When fully operational, the University of Chicago's data management system will provide tight bibliographic control over a wide variety of library services. Stanford University's BALLOTS represents another sophisticated experiment that promises network capability within a few years. Northwestern University has been operating an on-line technical services and circulation project, covering monographs and serials, for three years.[39] Taking into account the collective experience of these and similar programs, the time seems ripe for genuine cooperation among libraries towards the formation of a national network.

Library cooperation has been bandied about for so many years that one tires of hearing about it, yet today thousands of libraries continue to collect and catalog materials as if each were the sole guardian of all human knowledge. The idea of centralized processing, for instance, is so appealing that one wonders why there are not numerous regional processing centers already existing

throughout the nation. Certainly the technology of automated systems, telecommunications, and networking is not lacking [industry and business have been utilizing these techniques for years]; nearly everyone agrees in principle that cooperation is a necessary and 'good thing,' still we totter on the brink of some major breakthrough that never seems to materialize. Given this state-of-the-art, one can fully appreciate Philip Long's remark at the conference that the most startling thing about their system is that 'it works.' Here is one effort that has passed the blue-sky planning stage and is revolutionizing cataloging procedures in over a hundred libraries.

REPLICATION OR CONTRACT

Kilgour does not favor libraries joining OCLC on an individual basis. He prefers to contract with an established consortia. Basically there are two directions a new group joining the Center can take: it can either decide to replicate the OCLC operation in its entirety--minimally, this would cost about one million dollars during the first year;[40] or it can contract for services over a given period of time, usually three years. Though most have signed an agreement with the provision for future replication, aside from the already mentioned studies, none have begun to purchase hardware or duplicate files. For many groups replication seems out of the question on a cost basis alone.

OFF-LINE VERSUS ON-LINE CARD PRODUCTION

OCLC's off-line catalog card production mode is a limited approach to computerized cataloging. It does not provide the capability to search the entire data base, cannot be used as a location device for ILL purposes or for acquisitions searching. Perhaps more importantly, it does not have the long-range potential to curb the rising per title cost of cataloging. Its only advantage is that it does avoid the immediate high cost of leasing or purchasing

a terminal, renting a data set and the telephone line communications charges. The Center makes off-line operation available primarily for those libraries that have decided to participate in on-line cataloging, but a year or more will intervene between their decision to go on-line and actual implementation. During this transition period a library is encouraged to freeze cataloging positions and let attrition take its toll. In this way uncommitted salary funds can be used for later payment in the on-line phase.

There are serious shortcomings to off-line production. The data base is restricted to LC MARC tapes with no opportunity in 'shared cataloging' or to input original cataloging. With a file limited to English language monographs cataloged from 1968 to the present, the size of the data base is cut in half. Access is only by LC card number and these are found only in American imprints. The LC card number entry can be unreliable because the Library of Congress does not always use the originally assigned number--statistically, about one percent of them are incorrect. The off-line mode also creates delays since it requires waiting for a unit card, editing that unit card and returning it to Columbus, and then waiting again for the final set of catalog cards to arrive. As a result, personnel costs increase with the extra processing time involved.

In spite of these drawbacks, off-line operation does give a library the chance to get its feet wet in computerized cataloging. A new work flow can be established that will smooth the eventual transition to on-line techniques. It also gives a valuable trial period to work out the bugs in card format, holding libraries, and pack designations that often occur in a library's first profile.[41]

ASSESSING COSTS

It is extremely unlikely that there are enough institutions in Michigan to warrant full replication of OCLC for a state-wide network. Instead a service

agreement could be negotiated with Kilgour that would give those libraries belonging to the Michigan Cooperative, and desirous of tying in with OCLC, the opportunity to do so. As indicated earlier, there are complicated factors that must be considered in determining the costs each library would bear. Broadly, these costs can be grouped into four categories: a) communications cost; b) 'shared title' cost; c) catalog card costs; and d) Michigan Cooperative overhead cost. It bears repetition that an accurate calculation is impossible without full knowledge of the variable. The following figures are taken from PALINET experience; we may or may not enter into a similar contract.

a) Communications cost - These are especially difficult to pinpoint at this time since so much hinges on the kind of agreement we want to make with OCLC and what costs we want to share equally among ourselves. For example, in Ohio all members share the charges for lines, conditioning, data sets, local loops, and terminals. This has the effect of allowing smaller institutions with lower levels of use to participate in the system at less than if costs were paid individually. Closer to home, we are going to have to decide who will pay the line charges for those libraries that desire to tie in with OCLC located in this state's Upper Peninsula. Another vital question is do we want to rent terminals from OCLC or purchase them outright. Answers to these questions might invalidate figures cited below. Again, depending on how we work it, communications costs might include the following:

1) Purchase or rental of an OCLC 100 terminal; this is manufactured by the Beehive Corporation and sells for about $3400.00, with a yearly service contract for $468.00 and a terminal installation fee of $125.00. A second terminal might be needed for libraries cataloging over 12,000 monographic titles per year. If we decide to lease terminals instead of purchasing them, a library can expect to pay about a $175.00 per month rental fee.

2) Rental of a data set or MODEM for one year costs $660.00; each

library requires a data set, but two terminals can operate off one MODEM in the same library. In addition, the consortia must maintain a common MODEM at Columbus at the same cost.

3) Local loop costs is a wiring charge within the library and runs about $170.00 per year.

4) Line cost is an unknown at this time since we do not know how many lines are necessary or how far they must extend. Twenty-five to thirty terminals can operate off one dedicated line. A greater number of CRT's would require an additional line. There is a possibility that some terminals could tie in on the existing line that runs from Columbus to Toledo, thereby saving the per mile charge to Columbus. PALINET in Philadelphia, for instance, formerly paid line cost only as far as Pittsburgh. Included with line cost, there is a small telephone company service fee for 'conditioning.'

b) Shared title costs - This figure is derived from the number of anticipated 'shared titles' a library will catalog in the coming year, based on the number of monographic titles it cataloged in the previous year. In OCLC parlance, a 'shared title' represents the use of cataloging data for a monographic record that a library finds and produces cards from in the data base; there is no 'shared title' costs for original cataloging that one inputs into the file. OCLC experience indicates that about 68% of an average library's cataloging is 'shared.' Last year for libraries outside of Ohio, this cost was under $.90 per title. To illustrate how this is computed, if a library cataloged 10,000 monographic titles a year, and 68% of them were 'shared'. it would pay 6,800 times 90¢ or about $6170.00.

c) Catalog card costs - There is a per card cost of about 3.4¢ for each catalog card received from the Center. If a library required 6.6 cards per set--the average--it would amount to 23¢ per set.

d) Michigan Cooperative overhead costs - Currently this is another unknown.

Included in it would be the salary of the cooperative Director and any other staff, office equipment and space rental (unless these were donated by a member library), travel expenses, and the like. OCLC would require that there be a contact person in charge of helping to profile new Michigan libraries' profiles. There is also a one-time fixed fee for the Center's work in this--about $500.00 per library.

Regardless of how we arrive at cost elements, Mr. Kilgour has verbally indicated that an average cost per title cataloged in the system, including all possible costs, would not exceed $3.00 per title and would probably be very close to $2.25 per title.[42]

APPENDIX I

PLANNED OCLC SUBSYSTEMS

As mentioned earlier, OCLC was originally planned as an integrated library package consisting of five subsystems: 1) shared cataloging system, 2) serials control, 3) circulation control, 4) technical processing control, and 5) bibliographic information retrieval. Though there is no rigid timetable for initiating these other subsystems, OCLC has performed considerable research--sometimes bringing in an outside computer simulation firm--to help determine design parameters and to test the limits and capabilities of its system. For instance, an early (1969) COMRESS Inc. simulation identified the relative burden each subsystem would have on the central processor.[43] Assuming that the five elements represented 100% of the workload, the subsystems were weighted as follows:

Circulation control	79%
Bibliographic information retrieval	17%
Shared cataloging system	2%
Serials control	1%
Technical processing system (acquisitions)	1%

No doubt these ratios have changed over the past few years, they are included only to show that user-oriented systems make extraordinary demands upon a central processor.* If OCLC is already beginning to have some queuing and storage problems, with only the shared cataloging system in operation, it makes sense for Michigan libraries not to get too hopeful over implementation of other OCLC subsystems. At the Michigan conference on 14 November, Lawrence Livingston cautioned us that circulation control and funds control do not really belong in

* A statistical summary taken in August, 1973 of the OCLC operating system indicated that between 15 to 19% of the SIGMA 5 CPU is being utilized to run the shared cataloging mode. This includes the printing of catalog cards and communications with the hundred plus on-line terminals. Since the computer is not being used for any other purposes, the remaining CPU capability is now being wasted.[44]

a regional network; instead he believes they should be handled with a minicomputer within the individual library.

An interesting and more recent simulation study of the expandibility of the OCLC system beyond the present number of libraries--and taking into account the development of the additonal subsystems--was undertaken jointly by the staff of OCLC, COMRESS, and NELINET (New England Library Information Network) in early 1972.[45] With grant money received from the Council on Library Resources, Phase I of this project was designed to test the transferability of the OCLC data base and programs. It also involved a user-study of the off-line and on-line shared cataloging modes. While only estimates could be made about the characteristics of future subsystems, some conclusions were reached regarding such critical areas as network communications and on-line storage requirements. Results indicated that with adaptations the OCLC equipment is capable of handling additional subsystems and more libraries, depending on the number of terminals necessary and the network configuration. More specifically, OCLC estimates that its present equipment can support about 320 on-line terminals;[46] there are now 144 terminals tied into the system.

SERIALS CONTROL

The first stages of the serials control subsystem are scheduled to be implemented early in 1974. Even if this system works well in Ohio, it will not be available out-of-state until at least 1975. OCLC plans to divide serials work into four major components: 1) cataloging, 2) holdings, 3) check-in, and 4) claiming. Access to serial bibliographic records will be by the three standard search keys used in shared cataloging, as well as ISSN, key title, and Coden identifier. The 'cataloging' stage will be closely related to the cataloging system for monographs--the data base will then contain records for both monographs and serials. While the 'cataloging' record will show who owns a partic-

ular title with the three-letter institutional code attached as the bottom, there will also be a separate 'holdings' record linked to the main 'cataloging' record that will make it possible to review the entire holdings for every serial title in every holding library. For the most recent holdings information, the Center projects an abbreviated 'check-in' record restricted to a single screen on the terminal. Details behind the 'claiming' function have yet to be worked out.[47]

OCLC is also investigating the possibility of purchasing several serials data bases that are MARC compatible so that the system will begin with a core collection. When the serials check-in system is activated, on-line operating time will be extended to coincide with the operating hours of member libraries.[48]

As serial librarians know, there is a great deal of activity going on in this area on both a national and international level. The Library of Congress has now defined its record and over 3,300 serial titles have been distributed in MARC II format,[49] the National Serials Data Program (NSDP)--designated as the US participant in the International Serials Data System (ISDS)--has completed a final report on the conversion of about 55,000 serial titles in the Minnesota Union List of Serials (MULS) into a format meeting NSDP specifications for constructing a national serials data base,[50] and a working group under the auspices of the International Federation of Library Association (IFLA) Cataloging Secretariat has devised an International Standard Bibliographic Description for Serials (ISBD-S) that will soon be distributed for trial and discussion.[51] Needless to say, all these so-called 'standardized' records originated from different needs and hence are not totally compatible with one another.* In an effort to build a serials record data base fast enough to be of value to groups who have been postponing implementation of their own systems and to insure that there is

* For a discussion of the differences among the MARC, NSDP, and ISBD-S serial records, see Josephine Pulsifer's essay in the December 1973 issue of the Journal of Library Automation, p. 193-200.

compatibility in format and bibliographic data among the various records, a group known as the 'Ad Hoc Discussion Group on Serials Data Bases' (sometimes referred to as the 'Toronto Group')** has petitioned the Council on Library Resources (CLR) to coordinate a cooperative serial data base building project using the OCLC serials subsystem as a foundation. In addition to those libraries already tied in with OCLC, selected libraries with known excellence in serial records will be asked to participate on-line to Columbus. CLR will act as a contact point between the Center and participating libraries and help negotiate contracts; one immediate goal is aimed at the creation of a serials data base composed of 200,000 records to be input over a two year period.[52]

TECHNICAL PROCESSING SYSTEM

This subsystem is being designed to automate most of the routine clerical tasks now associated with an acquisitions department. While keeping tabs on purchase orders and outstanding order files, making periodic claims, and preparing financial commitment records, the system will also monitor itself in the sense that it will notify dealers for items not supplied on time and will notify library personnel of books that have been delayed in processing after receipt. In short, it is designed to oversee ordering, receipt, cataloging, and physical processing for the shelf. As part of this subsystem, each set of catalog cards requested will include a book pocket, circulation card, and spine label. A major advantage will be the inclusion of materials 'in-process' to the current on-line catalog so that a user can determine the existence and location of a book in a library system before complete entry in a card catalog has been accomplished.[53]

REMOTE CONTROL ACCESS AND CIRCULATION

** Its spokesman, Richard Anable of York University in Toronto, has written a history and purpose article appearing in the same journal and issue as mentioned above, p. 207-214.

The creation of a remote control access and circulation system is intended to serve patrons in searching a library's collection without having physical access to the card catalog. When the system is incorporated into a regional network, it would allow a user to search a book in any library in the network from a fraternity house, faculty lounge, or even home telephone. A somewhat similar system has been in operation on the Ohio State University campus since 1970. Access would be by author, title, and call number; if the book is available for circulation it could be charged out on-line and sent to the user through campus mail or some other delivery service. Such an arrangement would save vast amounts of time for both the user and the library; however it is questionable whether present OCLC equipment could handle the enormous increase in data communications. Eventually, of course, OCLC hopes card catalogs can be replaced by terminals.[54]

BIBLIOGRAPHIC INFORMATION RETRIEVAL

The capstone of the OCLC program is a subsystem built to permit users to search the shelf list of any participating library from remote areas by subject, author, joint authors or editors, title, and classification number. This is the kind of system people were talking glibly about ten or fifteen years ago--before a series of library automation failures put things in perspective. Not only do serious problems arise in searching by coordination of subject headings, there is the added intellectual problem of understanding how people make associations and search for information. To further complicate design, not all OCLC libraries use Library of Congress subject headings, nor do they all trace titles, joint authors, series, and the like. Of the four remaining systems to be implemented, this one is the longest way from operation. It is encouraging however to note that consortia like OCLC are looking at the big picture and not limiting their objectives to what can be accomplished in the immediate future.

APPENDIX II

MARC AND RECON PROJECTS

Since the most significant single step in advancing library automation made to date has been the availability of MARC bibliographical records on magnetic tape, it seems fitting to devote some attention to this standardized "communications format" that made such projects as OCLC possible. As the largest distributor of cataloging information, the Library of Congress was the natural choice to develop an experimental bibliographic cataloging system. The history of MARC (machine-readable cataloging) dates back to 1964 when a study was conducted by the Library of Congress's Information Systems Office to test possible methods of converting LC cataloging data into machine-readable form as a basis for printing such information by computer. Between 1964 and 1969 additional studies, tests, and a pilot project were carried out to determine the best practical bibliographical format to use for the distribution of all types of library material cataloging. Some of the major problems involved were the establishment of a national and international form for computer use, making it flexible enough to permit records to be processed on different types of computers employing different programming languages, insuring the data elements met the diverse needs of all kinds of libraries, and determining what access points were needed in order to make the greatest possible use of an automated system.[55]

Actual work began in 1965. In June of that year the Library of Congress published the first draft of a format based on standard LC cataloging practices. A conference was held a few months later at which time comments were elicited from librarians with ongoing automation projects and from major library interest groups. This conference generated a great deal of enthusiasm and a number of libraries expressed a desire to participate in a pilot project to experiment

with the use of machine-readable catalog data. Sixteen libraies were chosen to take part in the first MARC Pilot Project; they were selected on the basis of computer equipment available, proposed utilization of cataloging data, geographical location, and types of libraries represented. All participants were supplied with computer programs to manipulate the data within their own operational systems. The program lasted from November of 1966 until October of 1967 and achieved a far greater degree of acceptance than most dared to hope at the beginning of the experiment.

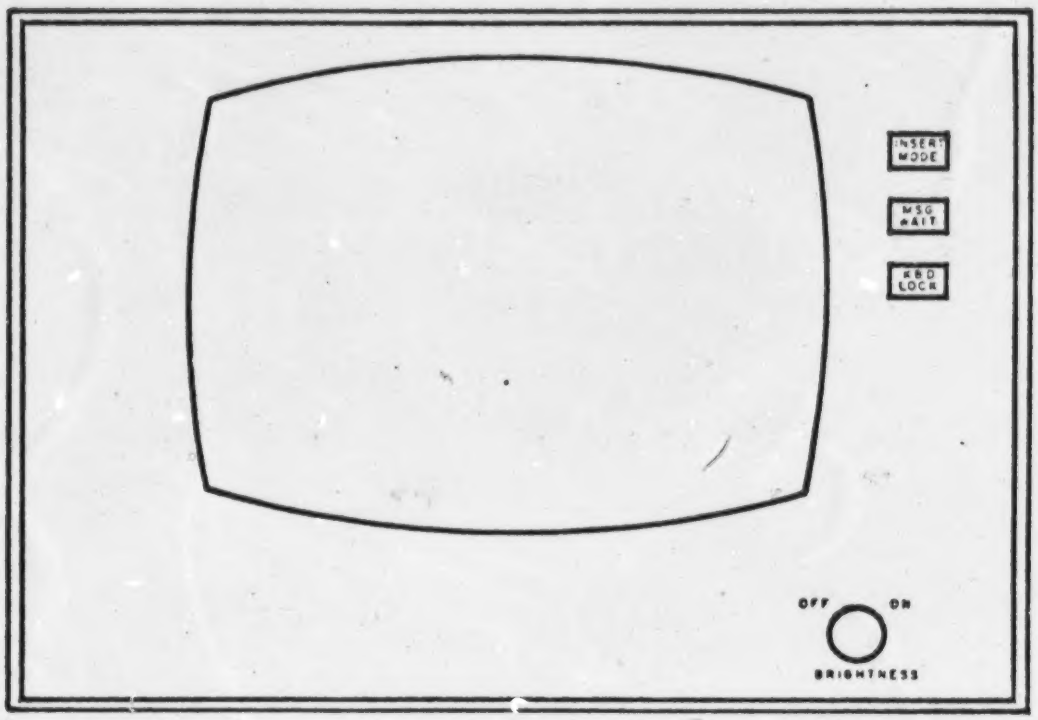
It became apparent, though, that the bibliographical record devised was inadequate, particularly for more specialized libraries. Consequently, the Information Systems Office formulated a more comprehensive record called MARC II. Perhaps the major difference between the first MARC records and the present ones is that early MARC titles were in a 'processing' format, while MARC II records are in a 'communications' format. In the meantime the project's name was changed to the MARC Interim System. This new phase presented the data in the slightly revised form established at a third conference held in late 1967.[56] The result of the MARC experiment was a clear demonstration that such a format could successfully be used in the production of classical library catalogs as well as in a variety of other library applications, some of which were made possible only by computerization. In March of 1969 the MARC Distribution Service was implemented to handle the expanded need of providing machine-readable records via magnetic tapes to other groups working in bibliographic computerization.

Since its inception approximately 403,125 records for books have been distributed to over 55 subscribers.[57] This already impressive stockpile of cataloging information is increased by 2,000 additional entries each week. As of this date the LC distribution service includes data for English monographs with imprint dates no earlier than 1968 and French language monographs since

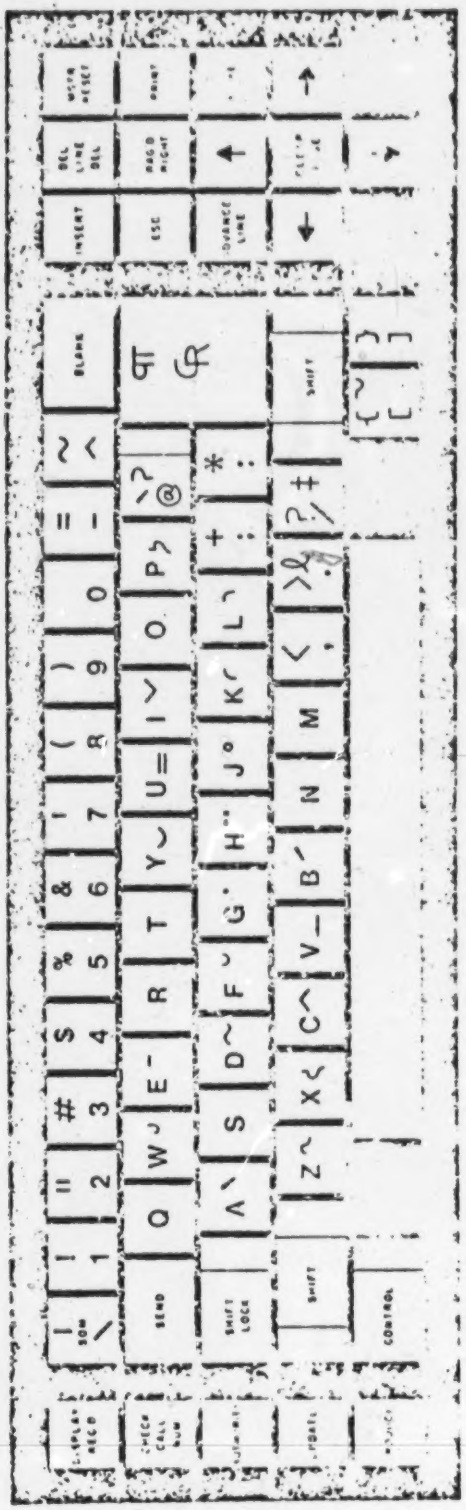
mid-1973. In the coming years LC plans to extend its coverage of book materials to include titles in the other European languages. Already MARC formats have been worked out for serials (3,300 distributed), for maps (5,500 distributed), and for films (15,100 distributed)[58]; tentative formats have been designed for other A/V items.

Another Library of Congress project has investigaed the most economical means of converting previously cataloged records to machine-readable form. This work, named RECON for 'Retrospective Conversion' , is aimed at the conversion of all English language and foreign language materials to MARC tape. Thus far RECON '68 and RECON '69 have been accomplished by manually keypunching the bibliographic records into the MARC format. Of course this method of converting the data is extremely costly and time-consuming. Experiments have been undertaken using a technique known as 'format recognition' to convert older records, which allows a machine to pick out and code the various elements in a record through identification of certain key words, punctuation, paragraphing, and word arrangement. This technique has been used by the MARC Editorial Division for input of all English-language monographs since January 1972. In a series of progress reports issued over the years, the Chairman of the RECON Task Force--Henriette D. Avram--has set down time-tables for the total conversion of LC data, but financial and technical difficulties have shown these to be unrealistic.

APPENDIX III



Irascope Terminal



Irascope Terminal:
Keyboard

APPENDIX IV

HC
475
.A64

Amuzegar, Jahangir.
Iran: economic development under dualistic conditions [by] Jahangir Amuzegar and M. Ali Fekrat. Chicago, University of Chicago Press [1971]
xiii, 477 p. 23 cm. (Publications of the Center for Middle Eastern Studies, no. 7)
Includes bibliographical references.

1. Iran--Economic conditions.
2. Petroleum industry and trade--Iran.
I. Fekrat, M. Ali, joint author.
II. Title III. Series: Chicago. University. Center for Middle Eastern Studies. Publications no. 7.

PPD 27Sep72 DXUsl 79-153044

Drexel University shelf list cards

Ref
AS
911
.A2N4
Index
1970-71
Gen

The foundation grants index, 1970-1971.
A two-year cumulative listing of foundation grants, compiled by The Foundation Center. Lee Noe, grants editor. New York, The Foundation Center, 1972.
xii, 292 p. 29 cm.

1. Endowments--Periodicals--Indexes.
I. New York. Foundation Library Center.
II. Foundation news.

PPD 27Sep72 DXUsl 72-76018

Minimum standards and guidelines for Pennsylvania local libraries receiving state aid.

Z
732
.P42
.P37x

Pennsylvania. State Library, Harrisburg. Bureau of Library Development.
Minimum standards and guidelines for Pennsylvania local libraries receiving state aid. Harrisburg, 1971.
1v. (unpaged) 28 cm.
Cover title.

Title added entry

1. Libraries--Pennsylvania--Standards. 2. Libraries and state--Pennsylvania. 3. Library legislation--Pennsylvania. 4. Federal aid to libraries--Pennsylvania. I. Title

PPD DXUat

ELECTRONIC DIGITAL COMPUTERS--PROGRAMMING--ADDRESSES, ESSAYS, LECTURES.

QA
76.6
.A913

Automatic programming and numerical methods of analysis. Edited by V. N. Faddeeva. Translated from Russian by N. H. Choksy. New York, Consultants Bureau, 1972.
vii, 125 p. illus. 28 cm.
(Seminars in mathematics, v. 18)
At head of title: V. A. Steklov Mathematical Institute, Leningrad.
Translation of Avtomaticheskoe programmirovanie i chislennye metody analiza.
Includes bibliographies.

Subject added entry

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ELECTRONIC DIGITAL COMPUTERS--PROGRAMMING--ADDRESSES, ESSAYS, LECTURES.

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Automatic programming and numerical methods of analysis. ... 1972.
(Card 2)

1. Electronic digital computers--Programming--Addresses, essays, lectures. 2. Electronic data processing--Numerical analysis--Addresses, essays, lectures. I. Faddeeva, V. N., ed. II. Akademiia nauk SSSR. Matematicheskii institut. Leningradskoe otdelenie. III. Series

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